bacilli were more often found in the milk of animals lightly infected than in those heavily diseased.

Dr. Klotz's observations, too, were strongly in support of the value of pasteurization of milk in preventing tuberculosis in human beings.

Dr. Rankin's experimental work was concerned with the effects of B.C.G. in cattle. Cattle vaccinated with B.C.G. reacted positively to tuberculin. Cattle derived from a tuberculosis-free source, and themselves free from tuberculosis, did not develop tuberculosis from seven months to one year after vaccination with B.C.G., pointing to the harmlessness of this vaccine. Animals inoculated with the B.C.G. and then injected with virulent *B. tuberculosis* (Vallée), and others inoculated with B.C.G. and subjected to the possibility of natural infection in the herd, developed some degree of immunity.

Dr. E. A. Watson, working with C. W. McIntosh and H. Konst, did somewhat similar work with guinea pigs and cattle, but was not convinced of the lack of virulence claimed for B.C.G. or of its immunizing value.

Dr. Baudouin, reporting on the work of the University of Montreal, in attempting to immunize infants by the oral administration of B.C.G., after the Calmette method and under skilled supervision, stated that no harmful effects had been observed in 759 cases.

Such discrepancies as were apparent in the results of the different observers might be explained on the grounds that the experiments were not entirely parallel, and differing time limits for reading the reactions had been adopted.

The Associate Committee felt that the work should be continued, but recommended that the rules formulated by the Paris Committee should be adopted. The same cultures of the B.C.G., grown on synthetic media, were to be used by the different centres and a time limit of six years was to be adopted.

The delay in obtaining definite information on matters that concern them so intimately will doubtless be somewhat discouraging to the stock raisers and dairy men, but apparently is inevitable under the circumstances if reliable information is to be obtained, for nothing less than the truth will do. Patience is still a virtue.

The full report of the Associated Committee will be awaited with interest. The work done so far is highly creditable to the research workers and to Canadian science.

A.G.N.

THE STREPTOCOCCUS AND ACUTE RHEUMATIC FEVER

THE ever recurring enigma, *i.e.*, the relationship of the streptococcus to acute rheumatic fever is gradually becoming clarified. The specific monalistic conception of the etiology of any disease has probably done much to keep the problem obscured, since no two streptococci isolated from cases of acute rheumatic fever ever appeared to be identical.

Two observations are fairly constant, however, in acute rheumatic fever; (1) the history of a nidus of infection usually in the tonsil, and (2) the isolation of a streptococcus from the blood stream in a small percentage of cases. The strains of streptococci obtained, however, differ serologically and in their sugar reactions, but are usually the non-hæmolytic type. Thus, in spite of the almost prophetic insistence of certain observers, the streptococcus etiology was not universally accepted.

The limelight has recently been focussed on the subject by the work of Small in Philadelphia, Birkhaug in Rochester, and Swift, Derick, Andrewes and Hitchcock at the Rockefeller Institute, whose work formed part of the symposium on rheumatic fever at the April Meeting of the Society for Clinical Investigation in Washington. To the Rockefeller Institute workers is due the credit for the observation that streptococci set up a state of allergy in the inoculated animals which hyper-react when subsequently inoculated with streptococcus products, a reaction in fact comparable to the tuberculin reaction. A most interesting

thing, however, is that this hyper-reaction, or allergic phenomenon, is not specific for one strain of streptococcus but may be elicited by subsequent injections of different strains from that first inoculated, irrespective of their being hæmolytic or non-hæmolytic in character.

It is possible then that rheumatic fever may represent a state of allergy or hypersensitiveness of the body to the streptococcus, which state may be maintained by a nidus of infection, in the tonsil, for example.

Further important disclosures have been brought to light by the Rockefeller Institute workers. They have found that this allergic state does not occur after intravenous injection of streptococci, but that animals so inoculated become immune. Their conception is that allergy occurs when there is a maximum reaction of a few body cells and that immunity follows a minimum reaction of many cells.

This observation is of wide biological significance and undoubtedly will be applied in the explanation and possibly in the treatment of infectious diseases caused by micro-organisms other than the streptococcus, just as the allergic state has been recognized as being of extreme importance in determining the type of response of an animal body to infections with the tubercle bacillus.

The observations of Birkhaug and of Swift, Derick, Andrewes and Hitchcock are not limited to animals but are being applied to normal human beings, rheumatic fever patients and recoveries, with apparently corresponding results, and one looks forward to the appearance of further papers on this subject from these latter authors, with particular reference to their findings that they can desensitise or render less allergic both animals and man by intravenous inoculation of small, repeated doses of streptococci.

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(See also Proc. Soc. Clin. Invest., May, 1928.)

ARNOLD BRANCH.

ON YELLOW FEVER

PROFESSIONAL interest in yellow fever to a great extent subsided after Reed, Carrol, and Agramonte, in their experimental work in Cuba, proved incontestably that a special mosquito the *Stegomyia fasciata seu calopus*, or as it is now termed *Aedes Ægypti*, is the carrier of the noxious germ. With the knowledge gained from this investigation and the known means of destroying the larvae of this insect in its breeding places it was found relatively easy by stringent regulations to keep the numbers of this mosquito at an efficient low level. By means of this newly acquired knowledge the Panama canal was built, all the larger cities were freed from disease, and travellers generally experienced relief from the dread of this dangerous pest. By the use of these means yellow fever ceased to exist as a menace in the New World.

In Africa, however, less dependence was able to be placed on these measures as, owing to the primitive nature of the population, it was impossible to depend upon their being efficiently carried out, and persistent investigations have been carried on for many years by medical officers in the Colonial Service, in the hope of discovering the causative organism from which an efficient antiserum could be made. Owing to the lack of success in these investigations a special commission was sent out to the West Coast of Africa by the Rockefeller Foundation to carry on further research, and shortly afterwards its numbers were increased by British representatives which included the late Adrian Stokes, and two other Englishmen. It was not long before Adrian Stokes made the important discovery that the disease was inoculable in Asiatic monkeys, and particularly in the species *Macacus rhesus*. It was found that in this species the virus was easily maintained by direct inoculation of blood and tissues or by mosquito transmission. By this means a greatly extended field was opened up for experimental investigation, and it became possible to show that the disease was not